

ECCOSTOCK[®] 0005

Low Loss, Polystyrene Rod and Sheet Stock

Material Characteristics

- Translucent, low loss, cross-linked, polystyrene stock
- It is a thermosetting plastic that will not flow when subjected to excessive heat
- Excellent high and low temperature stability
- Contains no fungus nutrients
- Pieces of ECCOSTOCK[®] 0005 can be bonded to itself or other materials

Applications

- ECCOSTOCK[®] 0005 has been used as the spacer in Type N connectors and for other machined parts in coaxial transmission lines
- Machined parts are also used as waveguide supports, antenna insulators, and as complete microwave lenses.
- Optical clarity and good mechanical properties have recommended this product for purely structural applications
- ECCOSTOCK[®] 0005 is able to withstand high voltages for producing gap switch houses, capacitors and other components
- High radiation resistance with little change in dielectric loss with exposures up to 1000m rads
- Other applications include material testing devices, surveillance equipment, radar windows, radomes and missile guidance system housings

Availability

- ECCOSTOCK[®] 0005 is available in the following standard sizes:
- <u>Sheets</u> 12" x 12" (30.5cm x 30.5cm) in thicknesses of 1/8, 1/4, 3/8, 1/2, 3/4, 1.0, 1.5, 2.0, 2.5 & 3.0" (0.32, 0.64, 0.95, 1.27, 1.91, 2.54, 3.81, 5.08, 6.35 & 7.62 cm)
- <u>Rods</u> 12" long (30.5cm) in diameters of 1/8, 1/4, 3/8, 1/2, 5/8, 3/4, 1.0, 1.5, 2.0, 2.5 & 3.0" (0.32, 0.64, 0.95, 1.27, 1.59, 1.91, 2.54, 3.81, 5.08, 6.35 & 7.62 cm)
- Other sizes, shapes, thicknesses, and configurations are available on special order

Machining

• ECCOSTOCK[®] 0005 is easily machined. Tools should be kept very sharp. Feed rate should be initially low and then increased with emulsion type coolants recommended

Typical Properties

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| Temperature Range, °F (°C) | -76 to 212 (-60 to 100) |
| Specific Gravity | 1.05 |
| Dielectric Strength, volts/mil (kv/m) | 500 (20) |
| Dielectric Constant, 1 MHz to 500 GHz | 2.53 |
| Homogeneity of Dielectric Constant | ± 0.02 |
| Isotropy of Dielectric Constant | ± 0.01 |
| Loss Tangent, 1 MHz to 500 GHz | 0.0005 |
| Volume Resistivity, ohm-cm | >10 ¹⁶ |
| Surface Resistivity, ohms/square | >10 ⁻¹⁴ |
| Coefficient of Linear Expansion, °F (°C) | 38 x 10 ⁻⁶ (68 x 10 ⁻⁶) |
| Thermal Conductivity, (cal)(cm)/(sec)(cm ²)(° C) (BTU)(in)/(hr)(ft ²)(°F) | 0.00035 1.01 |
| Rockwell Hardness, M Scale | 110-120 |
| Tensile Strength, psi (kg/cm ²) | 9,000 (633) |
| Flexural Strength, psi (kg/cm ²) | 11,500 (809) |
| Modulus of Elasticity, psi (kg/cm ²) | 23,900 (16,803) |
| Izod Impact, ft-lb/in (kg-cm/cm) of notch | 0.3 |
| Water absorption, % gain in 24 hours at $25^{\circ}C$ | <0.08% |
| %TML | 0.14/0.16% |
| %CVCM | 0.02% |
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